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APPLICATION FOR LETTERS PATENT

Applicants: SHIH-MING LIN

Title : DETACHABLE CONNECTOR FOR A
LAMP ON A PENDENT LAMP

9 Claims

8 Sheets of Drawings

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1 **DETACHABLE CONNECTOR FOR A LAMP ON A PENDENT LAMP**

2 BACKGROUND OF THE INVENTION

3 1. Field of the Invention

4 The present invention relates to a detachable connector, and more
5 particularly to an detachable connector for a lamp on a pendent lamp to easily
6 and quickly attach the lamp to or detach the lamp from the pendent lamp.

7 2. Description of Related Art

8 A pendent lamp is suspended from ceiling to provide illumination in
9 addition to a decorative effect indoors.

10 With reference to Fig. 8, a conventional pendent lamp comprises a frame
11 (40), a suspension member (46), multiple connecting arms (44) and a
12 corresponding number of lamps (42). The suspension member (46) such as a
13 chain, a post or the like has an upper end (not numbered) and a lower end (not
14 numbered). The upper end is attached to a ceiling (not shown), and the frame (40)
15 is attached to the lower end. The connecting arms (44) such as tubes respectively
16 have inner ends (not numbered) and outer ends (not numbered). The inner ends
17 are securely attached to and extend out from the frame (40). The lamps (42) are
18 connected respectively to the outer ends of the connecting (44). Wires (not
19 shown) are connected to the lamps (42), extend through the corresponding
20 connecting arms (44), the frame (40) and the suspension member (46) and are
21 electrically connected to a power source (not shown). Accordingly, the lamps
22 (42) will light and provide illumination.

23 However, the wires connected to the lamps (42) are not detachable from
24 the frame (40) and the lamps (42). Therefore, the connecting members (44) and

1 the lamps (42) of the conventional pendent lamp are securely connected to and
2 cannot be detached from the frame (40) and prevent a person of ordinary skill
3 from disassembling the conventional pendent lamp at home. Since the
4 conventional pendent lamp is large, transporting the conventional pendent lamp
5 requires a large space and is troublesome.

6 To overcome the shortcomings, the present invention provides an
7 detachable connector for a lamp of a pendent lamp to mitigate or obviate the
8 aforementioned problems.

9 SUMMARY OF THE INVENTION

10 The main objective of the invention is to provide an detachable
11 connector for a lamp on a pendent lamp to allow the lamp to be detachable from
12 the frame of the pendent lamp so a person can conveniently and easily connect
13 the lamps to or detach the lamps from the frame.

14 The detachable connector for a lamp on a pendent lamp has a holder, a
15 socket, an attaching device, a plug and a connecting tube. The holder is mounted
16 in the frame of the pendent lamp. The socket is detachably attached to the holder
17 by the attaching device and electrically connects to a power source. The plug
18 corresponds to and is selectively inserted into the socket to electrically connect
19 to the socket and is electrically connected to the lamp. The connecting tube is
20 attached securely to the plug and is connected to the lamp. With such a
21 detachable connector, the lamp is detachable from the frame of the pendent lamp
22 such that a person can easily and conveniently assemble or disassemble the
23 pendent lamp. Furthermore, the space required to transport or store the
24 disassembled pendent lamp is reduced.

1 Other objectives, advantages and novel features of the invention will
2 become more apparent from the following detailed description when taken in
3 conjunction with the accompanying drawings.

4 BRIEF DESCRIPTION OF THE DRAWINGS

5 Fig. 1 is an exploded perspective view of a detachable connector in
6 accordance with the present invention in a frame and a connecting member to a
7 lamp of a pendent lamp;

8 Fig. 2 is an exploded perspective view of a first embodiment of the
9 detachable connector in Fig. 1;

10 Fig. 3 is a side plan view in partial section of the adapter in Fig. 2;

11 Fig. 4 is an operational side plan view in partial section of the adapter in
12 Fig. 2;

13 Fig. 5 is an operational side plan view in partial section of the adapter in
14 Fig. 2;

15 Fig. 6 is an exploded perspective view of a second embodiment of a
16 detachable connector in accordance with the present invention for a lamp of a
17 pendent lamp;

18 Fig. 7 is an exploded perspective view of a third embodiment of a
19 detachable connector in accordance with the present invention for a lamp of a
20 pendent lamp; and

21 Fig. 8 is a perspective view of a conventional pendent lamp in
22 accordance with the prior art.

23 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

24 With reference to Figs. 1 and 2, a detachable connector in accordance

1 with the present invention for a pendent lamp having a suspension member (not
2 shown), a frame (30), multiple connecting members (34) and a corresponding
3 number of lamps (32) selectively connects a connecting member (34) to the
4 frame (30). The detachable connector comprises a holder (10), a socket (12), an
5 attaching device (not numbered), a plug (14) and a connecting tube (16). The
6 holder (10) is tubular, is mounted in the frame (30) of the pendent lamp and has a
7 central chamber (not numbered), an inner open end (not numbered) and an outer
8 open end (not numbered). In an optional embodiment, with further reference to
9 Fig. 3, the holder comprises a body (20), a bottom cap (21), a sliding tube (22),
10 multiple balls (23), a spring (24) and a pushing bar (26). The body (20) is tubular
11 and has an outer surface (not numbered), an inner surface (not numbered), an
12 inner open end (not numbered), an outer open end (not numbered), an elongated
13 through hole (202) and a tapered surface (204). The elongated through hole (202)
14 is longitudinally defined in the outer surface of the body (20), and the tapered
15 surface (204) is formed on the inner surface of the body (20) and corresponds to
16 the elongated through hole (202). The bottom cap (21) is attached to the inner
17 open end of the body (20) to close the inner open end and has a hole (not
18 numbered) defined through the bottom cap (21). The sliding tube (22) is
19 moveably mounted in the body (20) through the outer open end and has an outer
20 surface, a central passage (not numbered), a tapered surface (222) and multiple
21 bores (224). The tapered surface (222) is formed on the outer surface of the
22 sliding tube (22) and corresponds to the tapered surface (204) in the tubular body
23 (20). The bores (224) are defined in the tapered surface (222) of the sliding tube
24 (22), have a depth and communicate with the central passage. The balls (23) are

1 moveably mounted respectively in the bores (224), and each ball (23) has a
2 diameter larger than the depth of the corresponding bore (224). The spring (24) is
3 mounted between the bottom cap (21) and the sliding tube (22) to push the
4 tapered surface (222) on the sliding tube (22) against the tapered surface (204) in
5 the body (20). Because each ball (23) has a diameter larger than the depth of the
6 corresponding bore (224), the top of each ball (23) is pressed into the central
7 passage. The pushing bar (26) is pivotally mounted on the body (20) and has a
8 bottom penetrating through the elongated through hole (202) and corresponding
9 to the sliding tube (22).

10 The socket (12) is detachably attached to the holder (10) at the inner
11 open end with the attaching device and is electrically connected to a power
12 source with a first set of wires (not shown). In the optional embodiment, the
13 socket (12) is inserted into the hole in the bottom cap (21).

14 In a first embodiment, the attaching device comprises two first ears
15 (102), a cap (13) and two bolts (15). The first ears (102) are formed on and
16 extend from the holder (10), and each first ear (102) has a threaded hole (104). In
17 the optional embodiment, the first ears (102) are formed on and extend from the
18 bottom cap (21). The cap (13) is formed around the socket (12) and has two
19 second ears (132) formed on the (13) cap and respectively corresponding to the
20 first ears (102) on the holder (10). Each second ear (132) has a through hole (134)
21 defined through the second ear (132) and aligning with the threaded hole (104) in
22 the corresponding first ear (102). The bolts (15) penetrate respectively the
23 through holes (134) in the second ears (132) and are screwed respectively into
24 the threaded holes (104) in the first ears (102) on the holder (10) to attach the

1 socket (12) to the holder (10).

2 The plug (14) corresponds to and is selectively inserted into the socket
3 (12) from the outer open end in the holder (10) to electrically connect to the
4 socket (12). The plug (14) is electrically connected to the lamp (32) of the
5 pendent lamp with a second pair of wires (not shown). The connecting tube (16)
6 has an outer surface (not numbered), an inner end (not numbered) and an outer
7 end (not numbered), is attached securely to the plug (14) and is connected to the
8 lamp (32) of the pendent lamp through a connecting member (34) such as a tube.
9 A threaded hole (162) is defined in the outer end of the connecting tube (16), and
10 the connecting member (34) has an exterior thread (not shown) screwed into the
11 threaded hole (162) in the connecting tube (16). The second pair of wires extend
12 through the connecting tube (16) and the connecting member (34) and are
13 connected between the lamp (32) and the plug (14).

14 With further reference to Fig. 4, the inner end of the connecting tube (20)
15 abuts the tops of the balls (23) and pushes the sliding tube (22) to move relative
16 to the tubular body (20) when the plug (14) is inserted into the socket (12). With
17 the movement of the sliding tube (22) relative to the body (20), the tapered
18 surface (222) on the sliding tube (22) separates from the tapered surface (204) in
19 the body (20), and the balls (23) retract into the bores (224) to allow the
20 connecting tube (22) to pass over the balls (23). Consequently, the plug (14) can
21 be inserted into the socket (12), and the lamp (32) is selectively connected to a
22 power source through the second pair of wires, the plug (14), the socket (12), the
23 first pair of wires and a switch (not shown), and the lamp can be turned on to
24 provide illumination. With a restitution force provide by the spring (24), the balls

1 (23) are squeezed securely between the tapered surface (204) in the body (20)
2 and the outer surface of the connecting tube (16). Accordingly, the connecting
3 tube (16) is held securely in the holder (10) by the balls (23) and will not escape
4 from the holder (10) even when the connecting tube (16) is pulled.

5 To release the connecting tube (16) with the plug (14) from the holder
6 (10) with the socket (12), the pushing bar (26) is pivotally rotated and pushes the
7 sliding tube (22) to move with the bottom of the pushing bar (26). With the
8 movement of the sliding tube (22), the balls (23) will leave a position where the
9 balls (23) abut against the outer surface of the connecting tube (16). Accordingly,
10 the force for securely holding the connecting tube (16) provided by the balls (23)
11 is released, the connecting tube (16) with the plug (14) can be detached from the
12 holder (10). Because the plug (14) is detachably attached to the socket (12), the
13 lamp (32) with the connecting tube (16) and the plug (14) can be detached from
14 the socket (12). Therefore, the lamps (32) can be disassembled from the frame
15 (30), and any person can conveniently and easily assemble the lamp (32) to the
16 frame (30) by inserting the plug (14) into the socket (12). Accordingly, the lamps
17 (32) with the connecting members (34) can be detached from the frame (30)
18 when the pendent lamp is packaged, such that the space for transporting or
19 storing the pendent lamp is reduced.

20 With reference to Fig. 6, a second embodiment of the attaching device
21 comprises two hooks (106) and a cap (13'). The hooks (106) are formed on the
22 holder (10). The cap (13') is formed around the socket (12') and has two through
23 holes (136) formed on the cap (13') and respectively corresponding to the hooks
24 (106) on the holder (10'). When the socket (12') is inserted into the open end of

1 the holder (10'), the hooks (106) will hook on the through holes (136) on the cap
2 (13') to securely attach the socket (12') to the holder (10').

3 With reference to Fig. 7, a third embodiment of the attaching device
4 comprises two hooks (138) and two loops (108). The hooks (138) are integrally
5 formed on the socket (12''), and the loops (138) are formed on the holder (10'')
6 and respectively correspond to the hooks (138) on the socket (12''). The socket
7 (12'') is securely attached to the holder (10'') when the hooks (138) respectively
8 engage the loops (108).

9 With reference to Figs. 3 and 4, the socket (12',12'') in the second and
10 third embodiment is L-shaped so the space in the frame (30) for mounting
11 multiple adapters can be reduced.

12 Furthermore, the detaching device allows the socket (12,12',12'') to be
13 detached from the holder (10,10',10'') when the socket (12,12',12'') or the holder
14 (10,10',10'') is damaged.

15 Even though numerous characteristics and advantages of the present
16 invention have been set forth in the foregoing description, together with details
17 of the structure and function of the invention, the disclosure is illustrative only,
18 and changes may be made in detail, especially in matters of shape, size, and
19 arrangement of parts within the principles of the invention to the full extent
20 indicated by the broad general meaning of the terms in which the appended
21 claims are expressed.